Willamette National Forest Pilot Road Analysis

Appendix G

Forest Products Process Paper

October 1998

Introduction

Roads are essential to the management of the Forest Products Program on the Willamette National Forest. For the purposes of this analysis, the Forest Products Program is meant to include both the Timber Program and the Special Forest Products Program.

Roads provide access to the forest for planning, designing and implementing a wide range of timber harvest activities. These same roads provide access for equipment that can perform the logging and harvesting activities. They also provide access to the people and equipment that complete subsequent vegetation management treatments. The roads also provide access to individuals that gather special forest products such as Christmas trees, floral greenery, mushrooms, fence posts and firewood. Without the existing network of roads on the Willamette National Forest, many of the forest products activities we now take for granted would not be possible.

Process description/documentation

To begin to understand the importance of roads to management of the Forest Products Program, a list of questions were developed.

1. How do roads provide for the management of forest products in Matrix and Adaptive Management Areas (AMA)?

The structure of this question further refined the area of analysis for the Forest Products Section of the report to only Matrix and AMA land allocations. This is appropriate on the Willamette National Forest as the focus of harvest activities for both the timber and special forest products program is in the Matrix and AMA allocations. Programmed Sale Quantities are planned from AMA and Matrix land allocations.

Roads allow for access to forest products. All timber and most non-timber forest products come from within 2,000 feet of a road. Most timber comes from within 1,500 feet of a road. Non-timber products such as firewood and fence posts come primarily from within 100 feet of a road. These products are relatively heavy and most of their value is added in processing. More portable non-timber products such as Christmas trees, boughs, mushrooms, floral greenery and cones come from varying distances from the road, but their utility to the collector drops rapidly with increasing distance from roads.

Key Questions

- *How much of the area that is suited and available for timber management is accessed by the existing road system and can be logged using conventional yarding systems? Forest and watershed scale?*

To answer this question at the forest scale, a GIS analysis using existing data was performed. This analysis compared the existing system road layer with the forested lands in the Matrix and AMA land allocations. The analysis was done using the assumption that any land that was within 2,000' of an existing system road could be logged with conventional logging equipment such as yarders and tractors. Two caveats are worth discussing. The efficiency of cable logging systems falls off rapidly at yarding distances greater than 1,500 feet. Logging is

usually feasible at up to 2,000 feet, but not in all circumstances. Second, harvest and transport of special forest products is facilitated by proximity to roads. Watershed and project level analysis is needed to further refine the accuracy of the forest scale analysis. It is also expected that site specific analysis will identify areas where alternative harvest methods (ie helicopter) will be needed.

There are 444,577 of suitable and available matrix lands that are within 2,000 feet of a road.

- *Which suited and available acres are not accessed by the existing road system?* Forest and watershed scale

Using the same analysis described in question “A”, the watersheds on the forest were ranked as to their accessibility. In addition, the map generated in question "A" spatially located those areas that were more than 2,000 feet from a road.

There are 15,734 acres of suitable and available matrix lands that are not within 2,000 feet of a road.

- *How does road spacing and location affect logging system feasibility?* Watershed scale

If areas that are more than 2000 feet from a road are known, project teams can assess project feasibility when they move to watershed or project level analysis. Any watershed or project area that has a significant percent of the area further than 2,000 feet from a road will need to include either road construction or alternative (helicopter or other aerial systems) logging systems in project design.

The amount of logging spur road and the spacing of spur roads is related to cutting unit size and shape. This relationship has undergone a major change with the implementation of the Northwest Forest Plan. Streams are linear features, flowing across contours (downhill) in a dendritic pattern. Under the Northwest Forest Plan, streams are surrounded by buffers of up to 680 feet, where no timber harvest is allowed. This tends to constrain timber harvest to narrow slices of land between stream buffers, usually oriented between ridge and valley bottom. Roads built to access particular timber stands for logging are by necessity constructed along ridges or across the slope of a ridge (with the contour), commonly at right angles to stream buffers. Thus, under the Forest Plan, more miles of road must be constructed to reach the ‘slices’ of land available for harvest.

- *How does existing road access affect commercial and personal collection of special (non-timber) forest products?* Watershed and project scale.

Proximity to a road increases the value of products, from the perspective of customers who gather special forest products. The heavier the product, the less valuable it is at increasing distances from open roads. Firewood may only have value at less than 100 feet from a road. Mushrooms may retain some value at 2000 feet from a road.

Results

Results from analysis showed that the majority of the Matrix and AMA land allocations in the Willamette National Forest are accessed by existing system roads.

If Matrix and AMA lands within 2,000 feet of a road are considered accessible, more than 96 percent of the forest is accessible.

Access by watershed is shown in table 1. Table 2 describes the location and size of each watershed. Figure 1 shows the location of each watershed.

Table 1

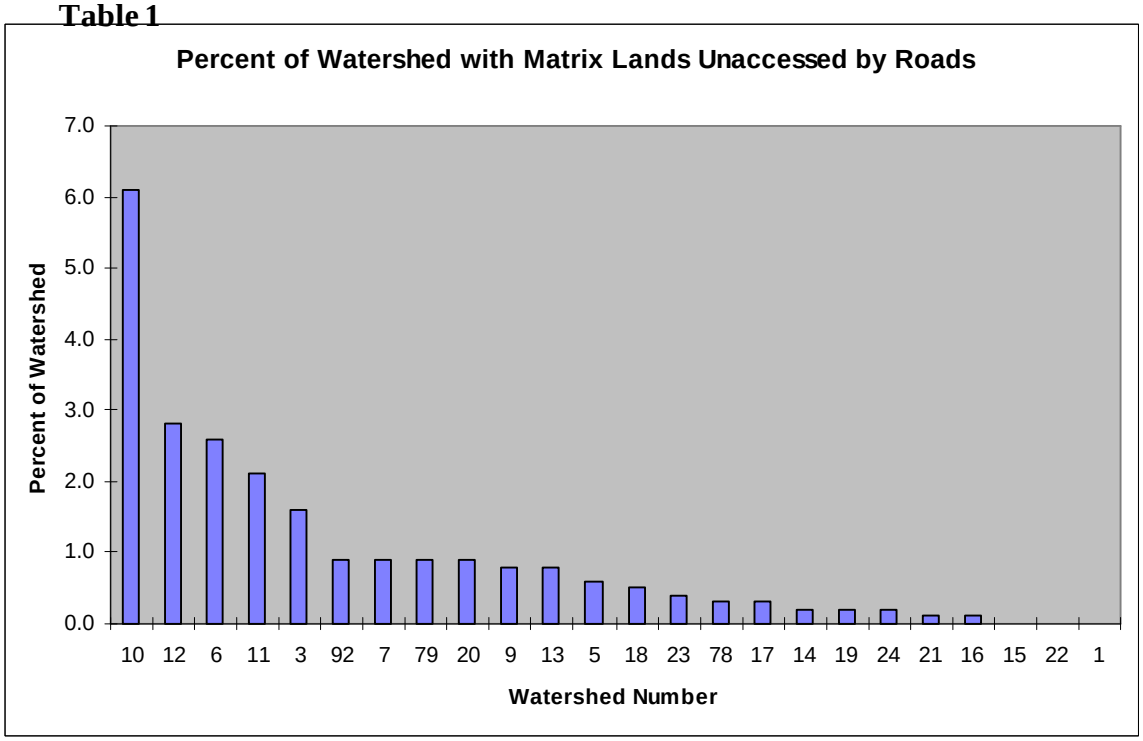

Table 2

Watershed Number	Watershed Name	Watershed Acres
1	Little North Santiam	40137.8
3	N Santiam, Downstream Tribs	39349.8
4	Quartzville Creek	39233.8
5	Middle Santiam	56038.6
6	South Santiam	92355.9
7	McKenzie	230925.5
9	Calapooia	6657.2
10	Blue River	59077.9
11	McKenzie, Minor Tribs	43525.2

Watershed Number	Watershed Name	Watershed Acres
12	Quartz Creek	27068.1
13	McKenzie, South Fork	137545.6
14	Horse Creek	101537.5
15	Fall Creek	87616.1
16	Winberry Creek	22637.3
17	Willamette, Lower NFk MFk	88427.1
18	Salmon Creek	82431.8
19	Willamette, Lookout Res	49352.4
20	Salt Creek	71769.3
21	Willamette, Mdl Fk Downstream Tribs	109916.1
22	Hills Creek	38456.5
23	Willamette, Upper Mdl Fk	113384.3
24	Willamette, Upper NFk MFk	69843.4
78	N Santiam, Blowout-Woodpecker	83122.6
79	N Santiam, Upstream Tribs	99388.3
87	Thomas Creek	546.2
91	Whitewater River	488.1
92	Breitenbush	61150.3
99	Molalla	588.7

Matrix lands that may need the development of more system roads to provide for use of conventional logging systems are quite limited on the forest. Those matrix lands appear to coincide with areas that are identified as "roadless". Generally, it would seem to be prudent to design logging systems that do not require the construction of more roads. Of course, the specific needs of a particular project must be further analyzed at the project scale.

Process Critique

1. The short amount of time for the process required that we use existing GIS data for analysis. In some cases this data was inaccurate. Because of the short time frame the data was not ground-verified. For future projects it would be more efficient to have this GIS data ready before analysis and synthesis started.
2. Our process allows only minimal public involvement.
3. The transferability of the specifics about what a conventional logging system may not be transferable to other parts of the country where the availability of logging equipment and the topography of the ground may be significantly different.

References

Toupin, Rick. 1998. Personal communication. Region 6, Logging Systems, Engineer.